An

A to Z Guide

to

Emissions Trading

(June 9, 2005)

This document is for discussion purposes only.

Expert stakeholders, including environmental groups, industry representatives and the public, provided input on its drafting, but have not yet reviewed or approved it. Alberta Environment is its sole author.

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SECTION 1: INTRODUCTION

Alberta Environment is implementing the recommendations of the Clean Air Strategic Alliance's Electricity Project Team for the management of air emissions from the electricity-generating sector.[1] The Electricity Project Team recommended new annual limits for nitrous oxide ($N0_x$) and sulphur dioxide ($S0_2$) emissions and an emissions trading program for these two substances.[2] The program allows unit operators some flexibility in meeting their new limits, and also creates an incentive for unit operators to make emission reductions before units must meet new annual emission limits. This document describes Alberta Environment's proposal for administering the emissions trading program for $N0_x$ and $S0_2$ emissions in the electricity sector.

The rules for the emissions trading program are complicated. This document is intended as a guide to the program and as a companion to the regulation and standard.

Alberta Environment welcomes comments on implementation of the emissions trading program. Send comments to:

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[1] *An Emission Management Framework for the Alberta Electricity Sector – Report to Stakeholders.* Prepared by the Clean Air Strategic Alliance Electricity Project Team (November 2003). Available at www.casahome.org.

[2] See Appendix A for a list of the recommendations related to emissions trading.

SECTION 2: DEFINITIONS

Unit: Separate components of a power plant facility that result in production of electrical energy. One power plant may have several units.

Unit Operator: The organization responsible for the environmental performance of a unit.

Credit: Permission to emit a specified amount (1 tonne or 900 kilograms) of NO_x and SO_2 according to the rules of the emissions trading program.

Baseline Emission Rate or Deemed Credit Threshold: An emissions intensity limit. The baseline is for existing units and is set based on the unit's emissions during the 2000 – 2002 period. The deemed credit threshold is for new units and is based on a set number or a percentage of their emissions limit.[3]

Design Life: Every unit participating in the emissions trading program has a Design life. The Design life is 30 years for gas units or 40 years or expiry of the Power Purchase Agreement for coal units. At the end of Design life, the unit must meet a new annual NO_x and SO_2 emissions limit.

Emissions Trading Program: The emissions trading program includes several components including:

- a regulation establishing the credit registry
- a standard explaining administrative procedures
- an emissions monitoring and reporting code
- the approvals governing the environmental performance of units.

[3] A baseline emission rate is an historical emissions rate for a unit between the years 2000 and 2002. A deemed credit threshold is based on the expected performance of a unit or is set in relation to the annual NOx and SO_2 emission limit for a plant. See *An Emission Management Framework for the Alberta Electricity Sector* at www.casahome.org for an explanation of how these terms are applied.

SECTION 3: ABOUT EMISSIONS TRADING

3.1 Overview of the Proposed Emissions Trading Program

Alberta Environment is implementing new annual NO_x and SO_2 emission limits for electricity generation units. All unit operators are to meet the new annual emission limits if they build a new generating unit or if an existing unit continues to operate after the end of its Design life.

The emissions trading program creates an incentive to make emission reductions before the new annual emission limits must be met. If a unit emits less than its baseline emission rate or deemed credit threshold, it will generate credits. The baseline emission rates and deemed credit thresholds are emission rates below a unit's currently allowed rate of emissions. Unit operators can also receive credits for shutting down their unit or meeting the annual emission limit earlier than required.

The emissions trading program allows a unit operator to use credits to meet its new annual emission limits when a unit reaches the end of its Design life. A unit's operator can use credits for a period of no more than 10 years, thereby enabling the unit to operate for a maximum of 40 years from commissioning for gas, and 50 years from commissioning for coal. To ensure that regional air quality guidelines are met, unit operators cannot use credits to meet their hourly emission limits.

Alberta Environment will consider including renewable and alternative power generation in the emissions trading program if the program is expanded. Alberta Environment will consult stakeholders when considering the expansion of the emissions trading program.

3.2 Implementation

Alberta Environment is working with industry, environmental groups and the public to design the emissions trading program and ensure its administration is transparent and efficient. The emissions trading program is proposed to start in January 2006.

The rules for the emissions trading program will be implemented through an emissions trading regulation and an associated standard. The regulation will establish the registry for credits. The standard will provide administrative details and guidance to unit operators, auditors and the registry operator. It will also explain how credits are calculated.

Some elements of the trading program will be implemented through facility approvals issued under the *Environmental Protection and Enhancement Act* (EPEA) and associated documents, such as the Continuous Emissions Monitoring Systems Code.

Alberta Environment will establish a public registry to track the creation, transfer and retirement of credits. Companies and individuals will buy and sell credits privately. The registry will record the transfer of credits between companies and individuals.

A unit's environmental performance is governed by an approval issued by Alberta Environment. Alberta Environment's current compliance mechanisms will ensure that new annual emission limits are met.

Alberta Environment is committed to implementing the emissions trading program in a timely manner to help realize the environmental benefits of early emission reductions.

3.3 Design Principles

Environmental Integrity

The program will ensure that credits are based on actual emission reductions and that credits are only used once. Documentation supporting the program will be reviewed to ensure it is complete and accurate.

Public Transparency

The program will ensure that documentation related to the program is available for public review. Prices, individual transfers and the holding in a particular account will not be available to the public. The Environmental Protection and Enhancement Act's (EPEA) provisions for confidentiality apply to the registry's operation.

Efficient Operation

The program's rules will be clear and will minimize administrative requirements to the extent possible without compromising the transparency or environmental integrity.

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3.4 Legal Framework

Alberta Environment proposes that these documents be created or modified to establish the emissions trading program:

- A new emissions trading regulation will:
    - be under the Environmental Protection and Enhancement Act (EPEA)
    - describe how credits can be created, transferred and used
    - establish the registry and set out the functions of the registry operator.
- A new emissions trading standard will:
    - provide technical information on:
        - how Alberta Environment approves a baseline emission rate or a deemed credit threshold
        - the calculation, creation, transfer and use of credits
    - explain the detailed operation of the program including forms, dates, and procedures.
- Existing and new approvals will:
    - indicate – for new units and units nearing the end of Design life – the unit's new annual NO_x and SO_2 emission limits
    - allow unit operators to meet their new annual NO_x and SO_2 emission limits for a limited time period by using credits.
- A new standard for air emissions from electricity generators will:
    - set limits for NO_x and SO_2 and particulate matter (PM) emissions from new units and units at the end of their Design life.
- The Continuous Emissions Monitoring Systems Code will:
    - set operating requirements for Continuous Emissions Monitoring Systems, including required tests for accuracy and precision
    - explain how missing data will be estimated
    - explain what alternatives to continuous emissions monitoring systems will be allowed.

3.5 Participation in the Emissions Trading Program

The generation and use of credits to meet emissions obligations will be a business decision made by unit operators. Alberta Environment proposes these criteria for units wanting to participate in the program:

- All operators of units over 25 megawatts must:
  - open an account with the registry operator
  - establish an historical baseline or deemed credit threshold
  - report the required data to the registry annually.

- Generating units larger than 25 MW are required to have CEMS systems.

- Units smaller than 25 megawatts can use credits to meet their emission limits for a maximum of 10 years at the end of their Design life. They may generate credits if they have CEMS (or equivalent) systems.

- Units must meet the requirements of the Continuous Emissions Monitoring Systems Code to generate credits.

- Units must meet public reporting requirements specific to the emissions trading program related to electricity generation, emissions and – for cogeneration units – steam generation data.

- Cogeneration units will calculate their emissions intensity based on their total energy output including both electricity and steam generation. However, credits can only be generated and used based on emissions associated with a cogeneration unit's electricity generation. Provision for cogeneration units that operate under a site approval and for which the emissions cannot reasonably be allocated between steam and power will be considered.

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3.6 About Registry Accounts

The registry operator will record the creation, holding, transfer and retirement of emission credits specific to each participant in the program. Each participating unit will have:

- A holding account where unused credits are recorded
- Retirement accounts for each year of the program
- Other accounts as needed for administering the program.

The registry operator will establish a set of accounts for each unit. One firm or facility may have many units and will have a unique set of accounts for each unit. Operators may choose to consolidate their credit holdings in one account to simplify administration, providing they move the credits to the appropriate accounts prior to retiring them for compliance purposes.

Individuals or organizations that do not generate electricity may open an account and participate in the trading program. They may do this to participate in the trading of credits for commercial purposes, or to purchase and retire credits for the environmental benefit (i.e. schools, etc.).

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SECTION 4: DETAILED GUIDE TO RULES AND PROCEDURES

4.1 Validation of Baseline Emission Rate or Deemed Credit Threshold

- All units that have a maximum capacity rating of 25 megawatts or greater must apply for a baseline emission rate or a deemed credit threshold prior to December 31, 2006.

- Unit operators will apply to Alberta Environment to have their historic baseline emission rate or deemed credit threshold approved. The application procedure for validation of a baseline emission rate or a deemed credit threshold will be explained in the emissions trading standard.

- Unit operators applying to establish a baseline emissions rates or deemed credit thresholds will provide supporting documentation including, but not limited to:

    - A description of the unit
    - A description of the monitoring systems for electricity generation, emissions and, where necessary, steam
    - The relevant reports and tests of the accuracy of the monitoring system as required by their approval and associated documents such as the Continuous Emissions Monitoring Code
    - Data from the calendar years 2000 to 2002 or other years as required by the program
    - If necessary, an explanation of why the 2000-to-2002 base years are not used in calculating a baseline emission rate
    - Any relevant audits undertaken by Alberta Environment
    - A formal declaration by an auditor that the documentation is in the appropriate form; complete and accurate.

- Alberta Environment may ask for clarification of the data submitted or request further information.

- The public can comment on the proposed baseline and associated documentation within a limited time period.

- An arbitration process is under consideration if the unit operator and Alberta Environment do not agree on the baseline emission rate or deemed credit threshold.

- All the documentation used to validate a baseline will be made public and must be submitted to the department in the format specified.

4.1.1 Auditors

An independent, private-sector auditor will review all documentation associated with a unit's baseline emission rate or deemed credit threshold and applications for emission reduction credits. This review and audit of documentation will be in addition to Alberta Environment's routine review and audit of air emissions data. Alberta Environment will specify, in the emissions trading standard, which documents are to be reviewed.

- The third-party auditor must hold a professional designation such as Chartered Accountant or Professional Engineer. The details of these requirements are under review. The auditor or the staff performing the audit must:
    - have demonstrated experience in air emissions monitoring
    - have demonstrated knowledge of the Continuous Emissions Monitoring Systems Code and its associated documents
    - have other qualifications to be specified in the emissions trading standard
    - be independent from the unit operator and demonstrate that independence ("arm's length" relationship).

The auditor must formally declare that to their professional judgement the documentation associated with a baseline emission rate, deemed credit threshold or credit is in the appropriate form, complete and accurate. The nature of this formal declaration is being developed. The tasks the auditor must perform will be specified in the emissions trading standard.

- All registry documents will be publicly available, except where provisions for confidentiality under the Environmental Protection and Enhancement Act (EPEA) apply. Prices, individual transfers, and the holding in individual accounts will not be publicly available.

4.2 Creation of Credits

Credits for emission reductions from a baseline emission rate or deemed credit threshold will be provided according to the rules and procedures described in this section. A credit gives a unit operator the right to emit a specified amount of NO_x or SO_2 according to the guidelines established in the emissions trading program.

A credit is generated if a unit operates below its historical baseline level of NO_x or SO_2 emissions or a deemed credit threshold.

- Unit operators must apply to Alberta Environment to have a credit created.

- A credit is created when it is given a unique serial number and recorded in the registry. Credits are dated on December 31 of the year when the emission reductions occurred, no matter when the credit creation occurs. Discounting is applied on the basis of this date.

- The minimum value for a credit is one tonne, but that will be discounted to 900 kilograms after one year if the credit is not used. Rules for discounting will be explained in the emissions trading standard.

- A unit operator must provide documentation to support the creation of a credit that includes:

    - relevant reports and tests of the accuracy of the monitoring system
    - relevant emissions, electricity generation and, where necessary, steam generation data
    - formal declaration by an auditor that the documentation is in the appropriate form, complete and accurate.

- Where errors occur in the calculation of credits, existing credits will not be cancelled. A unit operator that creates credits in error will need to retire enough credits to address the error.

- The unit operator will maintain the documents associated with the credits for 10 years. The documents associated with the baseline emission rate or the deemed credit threshold must be maintained for 10 years.

- The registry is the official record of whoever holds a credit.

- The opportunity to have a credit recognized expires two years after the actual emission reductions. For example, a credit for an emission reduction in 2011 must be created by December 31, 2013.

4.2.1 Credits for early shutdown and transition credits

- Unit operators may receive credits for shutting down a unit on or before the end of its Design life, or if they commit to meeting emissions standards for new units within three years of the end of Design life.[4]

- The process for recognizing these credits is the same as above except:

    - A unit operator can only apply for credits after a unit is shut down or approved plans for retrofitting are in place.

    - A unit operator receives shutdown or transition credits on an annual basis.

    - Shutdown and transition credits are discounted by 10 percent after one year if not used.

4.3 Emissions Trading Registry

- Alberta Environment will be responsible for the operation of the emissions trading registry, although the operation of the registry may be delegated to a third party.

- Information in the registry will be available to the public through the registry's website.

- Fees to cover the administrative costs of the registry are under consideration.

- The registry database will contain information identifying the account holder.

- The registry will track each credit created, transferred, held, and retired.

- Account holders must inform the registry operator of changes in the legal name of the individual or organization holding the account.

- The information in the registry will be publicly available except for:

    - current holdings of emissions credits by a particular account holder
    - individual transfers of emissions credits.
      (The preceding will be summarized on an annual basis.)

- The registry operator will issue unique serial numbers and record credits. Serial numbers will contain sufficient information to track the credit's source and determine the date on which it is discounted.

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[4] The calculation of these credits is specified in the CASA recommendations (see appendix A).

- Account holders must apply to the registry operator to transfer or retire credits.

- Where and when possible, electronic submission of registry documents will be facilitated.

- The registry operator will track the history of transactions associated with each credit.

- The registry operator will prepare a public annual report that includes at least the following information:

    - Credits created in the calendar year
    - Credits used for compliance in the calendar year
    - Total number of credits discounted
    - Outstanding credits
    - Total volume of trades in tonnes, and the number of transfers.

4.4 Use of Credits

- Alberta Environment will allow unit operators to meet their annual NO_x or SO_2 emission limits using credits for a maximum of 10 years at the end of a unit's Design life. Unit operators cannot use credits to meet hourly emission limits.

- Unit operators must submit a report on their gross emissions and electricity generation and, where necessary, steam generation, by March 31 of the following year.

- Unit operators must retire the necessary number of credits to meet their annual emission limits by April 30 of the following year.

- Unit operators must submit a report by May 31 that indicates their emissions requirements, actual emissions, and the number of credits retired to meet their compliance obligations. This report will include verification from the registry that the required credits have been retired.

- Emission credits from other jurisdictions cannot be used for compliance within Alberta.

4.5 Public Transparency

A public website will help ensure that the operations of the emissions trading program are transparent. The information provided on the website will include:

- the historical baseline or deemed credit threshold for each unit
- a unit's annual emissions reports
- when the unit must make physical reductions to meet the annual emissions limit rather than use credits to meet the limit
- the number of credits created each year and the total number of credits in existence
- the serial number of each credit that identifies what unit created the credit and in what year
- the annual report of the registry.

- The following information will be available to the public from the unit operator on request:

  - detailed emissions data.

  The following information will not be made publicly available:

  - current holding of credits by account holders
  - information on individual transfers of emissions credits
  - the price of credits (these will not be tracked by the registry).

SECTION 5: SUMMARY OF PROPOSED ROLES AND RESPONSIBILITIES

1. Unit Operator

a. Calculates and submits baseline emission rate or deemed credit threshold application to Alberta Environment for approval.
b. Meets monitoring and reporting requirements of the emissions trading program.
c. Assesses opportunities and potentially acts to reduce emissions and generate credits.
d. Prepares documentation supporting the creation of a credit and arranges for an independent auditor to make a formal declaration that the documentation is complete and accurate.
e. Submits documentation and formal declaration to the registry operator.
f. Meets both hourly and annual emission limits specified by Alberta Environment.
g. At end of Design life, if not retrofitting or shutting down, uses credits to meet new annual emission standards.

2. Alberta Environment

a. Establishes and updates rules and procedures associated with the emissions trading program.
b. Amends approvals to include the new annual emission limits and specifies how long credits can be used to meet annual limits.
c. Validates baseline emission rates and deemed credit thresholds.
d. Ensures the efficient functioning of the public registry.
e. Establishes and publishes criteria for auditors.
f. Conducts periodic audits of emissions monitoring systems.
g. Conducts periodic audits of credit creation reports.
h. Educates stakeholders and staff on the emissions trading program.

3. Registry Operator

a. Maintains data and documentation on credit creation, holdings, transfers, and use.
b. Ensures completeness of documentations submitted to the registry.
c. Maintains a public website of the registry's data and documentation.
d. Produces annual report on credit activity.

4. Auditor

a. Reviews documentation on historical baseline rates, deemed credit thresholds and credit creation applications provided by the unit operator to

ensure that documentation is in the appropriate form, complete and accurate.

b. Makes a formal declaration that the documentation is in the appropriate form, complete and accurate.
c. Maintains the required professional designation and other qualifications as specified in the emissions trading program.

5. Public

a. Reviews documentation on baseline emission rate, deemed credit threshold or credit applications during the public review period.
b. Addresses concerns regarding these applications to Alberta Environment.

6. Broker

a. Facilitates transfers of credits.

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APPENDIX A: CLEAN AIR STRATEGY ALLIANCE RECOMMENDATIONS ON EMISSIONS TRADING (Electricity Project Team)

#8 NO_x and SO_2 Emissions Management Approach

The Project Team recommends adoption of a baseline and credit emissions trading program at this time for NO_x and SO_2. To manage NO_x and SO_2 from Alberta's electricity generation sector, the team recommends that

1. Baseline emission rates for both new units and existing units that are at the end of Design life are the Best Available Technology Economically Achievable (BATEA) limits of the day.
2. The emission rate for existing units prior to the end of their Design life is the currently approved emission rate as specified in the regulatory approval.
3. For the purposes of credit generation, where not otherwise covered by points 4, 5, 6 or 7 below, the following will apply: The baseline emission rate for existing units would be established based on the average emissions per megawatt hour (MWh) in the 2000-to-2002 period inclusive. For cogeneration units, the baseline emission rate will be based on the combined heat and electricity in MWh. In the event of unusual operating conditions or a prolonged shutdown during that period, the baseline would be based on the three most recent "average" years of operation. A unit that has been recently commissioned would have its baseline set by the first three years of operation. In the case of an existing unit that does not yet have three years of operation, the first year of "normal" operation would be used.
4. The deemed credit threshold for the 2006 BATEA standards, as applied to new coal-fired units, is 90% of the BATEA level.
5. Credits for performance better than the deemed credit threshold are subject to a one-time discount of 10% if they are not used within 12 months of being certified.
6. The deemed NO_x credit threshold for new (post-2005) gas units (including peaking units) is as follows:
    i. 0.5 kg/MWh for units less than 20 MW in capacity rating.
    ii. 0.3 kg/MWh for units between 20 and 60 MW in capacity rating.
    iii. 0.2 kg/MWh for units greater than 60 MW in capacity rating.
7. The deemed NO_x credit threshold for existing gas units is as follows:
    i. 0.2 kg/MWh for units operating below 0.2kg/MWh. As this threshold already incorporates the concept of deemed credit threshold and an environmental discount, #5 above would not apply to these units.
    ii. baseline emission rates for units operating above 0.2kg/MWh.
    iii. 0.2 kg/MWh for all peaking units operating above 0.2 kg/MWh. Peaking units can generate credits to a maximum of the difference between actual NO_x emissions and the NO_x emission cap applying to that unit.
8. Credits for existing units that shut down before the end of Design life will be granted based on:
    i. the number of years between shutdown and end of Design life.

ii. the difference between the unit's baseline emission rate or deemed credit threshold, where applicable (kg/MWh), and the BATEA emission rate of the day and the corresponding deemed credit threshold applicable to new units.
iii. the unit's generation rate (MWh/year), which will be the average of the three highest years' generation in the last five years before shutdown.

9. Unlimited banking of credits.
10. Units that reach the end of Design life and commit to either shutting down on that date or upgrading to BATEA within three years of that date are eligible for transitional allocations based on the following formula: BATEA limit of the day (kg/MWh) x three years x the average of the three highest years' generation in the last five years (MWh). Consistent with the 2010 shutdown or upgrade requirements of their Environmental Protection and Enhancement Act (EPEA) approval, the Wabamun generating units are not eligible for this provision.

For units that have reached the end of their Design life, there will be a 10-year limitation, to a maximum operating life of 50 years for coal, 40 years for gas, and 60 years for peaking gas units, on the use of credits to meet new BATEA limits, at which time the existing unit must physically upgrade to comply with the BATEA emission limit of the day or shut down. Consistent with the 2010 shutdown or upgrade requirements of their EPEA approval, the Wabamun generating units are not eligible for this provision. For exceptions, see Recommendation 10.

#9 Implementation of the Management Approach for N0x and $S0_2$

Alberta Environment establish a multi-stakeholder committee to support and advise the department in the implementation of the $N0_x$ and $S0_2$ emissions trading program, and address any outstanding details.

Alberta Environment, in consultation with the multi-stakeholder committee, examine opportunities to merge or harmonize the $N0_x$ and $S0_2$ emissions trading program for the electricity sector with a cross-sectoral cap and trade or any other form of emissions trading program. Access by any other types of electricity generators to any provincial N0x and $S0_2$ trading system should also be examined at that time.

Future consideration be given to converting the $N0_x$ and $S0_2$ emissions trading program for the electricity sector to a cap and trade system.

 # 37 $S0_2$ Monitoring in Support of an Emissions Trading Program

Alberta Environment and the electricity sector build upon the existing continuous emission monitoring program for $S0_2$ to develop an effective $S0_2$ monitoring and tracking system that can support a $S0_2$ emissions trading program.

#38 $N0_x$ Monitoring in Support of an Emissions Trading Program

That Alberta Environment and the electricity sector build upon the existing continuous emission monitoring program for $N0_x$ to develop an effective $N0_x$ monitoring and tracking system that can support a $N0_x$ emissions trading program.

#39 Public Availability of NO_x and SO_2 Monitoring Data

Alberta Environment and the electricity sector continue to ensure that NO_x and SO_2 emission monitoring data from electricity generation units remains available to the public.

#40 Public Availability of SO_2 Emission Trading Information

a) Alberta Environment and the electricity sector ensure that information on SO_2 emission trading associated with achieving the SO_2 emission management targets in these recommendations is available to the public.

b) Alberta Environment require, by regulation, approval or other legal means, that coal-fired power plants report on the creation and use of SO_2 credits and that this information be public.

#41 Public Availability of NO_x Emission Trading Information

a) Alberta Environment and the electricity sector ensure that information on NO_x emission trading associated with achieving the NO_x emission management targets in these recommendations is available to the public.

b) Alberta Environment require, by regulation, approval or other legal means, that thermal power plants report on the creation and use of NO_x credits and that this information be public.

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